NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

COVER CROP

(Acre)

CODE 340

DEFINITION

A crop of close growing grasses, legumes, forbs, or other herbaceous plants established for seasonal cover and conservation purposes.

PURPOSES

- Reduce erosion from wind and water
- Increase soil organic matter
- Manage excess nutrients in the soil profile
- Promote biological nitrogen fixation
- Increase biodiversity
- Weed suppression
- Provide supplemental forage
- Soil moisture management

CONDITIONS WHERE PRACTICE APPLIES

On all lands requiring vegetative cover for natural resource protection, including cropland, certain recreation and wildlife areas and orchards and small fruit areas.

CRITERIA

General Criteria Applicable To All Purposes

Plant species, seedbed preparation, seeding rates, seeding dates, seeding depths, and planting methods will be consistent with approved local criteria and site conditions.

The species selected will be compatible with the nutrient management and pest management provisions of the plan.

Cover crops will be terminated by harvest, frost, mowing, tillage, and/or herbicides in preparation for the following crop.

Herbicides used with cover crops will be compatible with the following crop

Cover crop residue will not be burned.

Date of Seeding. To produce maximum growth, sow cover crop as soon as possible after crop harvest. Some cover crops can be sown at the same time or immediately following last cultivation of row crops. Most cover crops will normally be sown between August 15 and September 15. In the Champlain Basin Area (MLRA 142 and 144A) and lower Connecticut River Valley (MLRA 145) cover crops can be planted as much as a month later.

Fertilization. Cover crops usually follow heavily fertilized crops. Apply fertilizers as needed to produce sufficient growth for the intended purposes of cover or green manure crops in accordance with soil tests. In the absence of soil tests, apply 10-5-10 fertilizer at five hundred pounds per acre on medium-textured soils. Apply lesser amounts on sandy soils to reduce danger to ground water contamination.

Cereal Grains	
Oats	1 to 2 bushels per acre
Rye	1 to 1.5 bushels per acre
Triticale	1.5 bushels per acre

If broadcast and disked into the soil, seeding rates for cereal grains shall be increased by 50%.

Grasses	
Field Bromegrass	15 pounds per acre
Orchardgrass	10 to 15 pounds per acre
Annual Ryegrass	15 to 10 pounds per acre

Cool season grasses should be seeded no later than September 1.

Field bromegrass produces a great volume of root growth in the spring of the year following fall establishment. Under dry conditions or when unable to plant before September 15, seed with Winter Rye.

Time and Manner of Incorporation of Crop into the Soil. Cover crops shall be left on the surface over winter. They are generally worked into the soil the following year or left on the surface to provide protective residue.

Green manure crops generally will be incorporated into the soil in the spring following seeding, usually when top growth reaches 8 to 18 inches in height.

Additional Criteria to Reduce Erosion From Wind and Water

Cover crop establishment, in conjunction with other practices, will be timed so that the soil will be adequately protected during the critical erosion period(s).

Plants selected for cover crops will have the physical characteristics necessary to provide adequate protection.

The amount of surface and/or canopy cover needed from the cover crop shall be determined using current erosion prediction technology.

Additional Criteria to Promote Biological Nitrogen Fixation

The specific Rhizobia bacteria will either be present in the soil or the seed will be inoculated at the time of planting legumes.

Nitrogen credits from legume cover crops will be accounted for in the nutrient management plan.

Additional Criteria to Manage Excess Nutrients in the Soil Profile

Cover crops will be established and actively growing before expected periods of high precipitation that can cause leaching.

Cover crop species will be selected for their ability to absorb large amounts of nutrients from the rooting profile of the soil.

The aboveground biomass will be removed from the field for maximum nutrient removal efficiency.

Additional Criteria to Increase Soil Organic Matter

Cover crop species will be selected on the basis of producing high volumes of organic material to maintain or improve soil organic matter.

The NRCS Soil Conditioning Index (SCI) procedure will be used to determine the amount of biomass required.

The cover crop will be terminated as late as feasible to maximize plant biomass and still prepare the seedbed for the subsequent crop. Cover crops may be sown in the spring or fall for turndown the following spring. Some cover crops are grown to improve soil organic matter and tilth and may be plowed the same year seeded.

Seeding Mixtures on Well Drained and Droughty Sites (Pounds Live Seed)	
Alfalfa	10 to 12 pounds per acre
Sudangrass	25 to 30 pounds per acre
Buckwheat	75 to 100 pounds per acre
Hairy Vetch	25 to 30 pounds per acre

Seeding Mixtures on Somewhat Poorly Drained Soils with Moderate pH	
Medium Red Clover	8 to 10 pounds per acre

Additional Criteria to Increase Biodiversity

Cover crop species shall be selected that, have different maturity dates, attract beneficial insects, serve as a trap crop for damaging insects, and/or provide food and cover for wildlife habitat management.

Additional Criteria for Weed Suppression

Species for the cover crop will be selected for their chemical or physical competition with weeds.

Cover crops residues will be left on the soil surface to maximize allelopathic (chemical) and mulching (physical) effects.

For long-term weed suppression, perennials and/or biennial species can be used.

Additional Criteria to Provide Supplemental Forage

Species selected will have desired forage traits, be palatable to livestock, and not interfere with the production of the subsequent crop.

Forage provided by the cover crop may be hayed or grazed as long as sufficient biomass is left for resource protection.

Additional Criteria for Soil Moisture Management

Terminate growth of the cover crop sufficiently early to conserve soil moisture for the subsequent crop.

Cover crops established for moisture conservation shall be left on the soil surface until the subsequent crop is planted.

In areas of potential excess soil moisture, allow the cover crop to grow as long as possible to optimize soil moisture removal.

CONSIDERATIONS

The cover crop should be terminated as late as feasible to maximize plant growth and still prepare the seedbed for the subsequent crop.

Deep-rooted species provide maximum nutrient recovery.

Consider that grasses utilize more soil nitrogen, and legumes utilize both nitrogen and phosphorus.

Avoid cover crop species that attract potentially damaging insects.

Acceptable benefits, for most purposes, are usually accomplished when the plant density is at least 25 stems per feet, the combined canopy and surface cover is at least 60 percent, and the above ground (dry weight) biomass production is at least 2700 lbs/acre.

Cover crops may be used to improve site conditions for establishment of perennial species.

PLANS AND SPECIFICATIONS

Plans and specifications will prepared for the practice site. The State standard will specify practice requirements for site specifications. Specifications will include, but are not limited to, recommended species, seeding rates and dates, establishment methods, nutrients needed, and other establishment information. Specifications can be recorded in narrative format, on job sheets, or forms designed to provide specific requirements for the practice. In lieu of a conservation plan, provide a location map and document the seed mixture(s), planting date(s), and number of acres planted.

OPERATION AND MAINTENANCE

Control growth of the cover crop to reduce competition from volunteer plants and shading.

Control weeds in the cover crop by mowing or herbicide application.

REFERENCES

http://pss.uvm.edu/vtcrops/index.html

http://www.uwex.edu/ces/crops/uwforage.htm